

REMARKS

Claims 1-6, and 8-25 are pending in the present application. Claims 20-23 are withdrawn from consideration. In an Office Action dated December 27, 2007, claims 1-6, 8-19, 24 and 25 are rejected. In this response, claim 14 is amended to indicate that the composite material is an aircraft composite material. Applicant notes the paragraphs in the Office Action dated December 27, 2007 include a numbered paragraph 2 on page 2 and a numbered paragraph 4 on page 3, with no intervening paragraph 3. Applicant will respond to the Office Action on the assumption that paragraph 4 et seq. were inadvertently misnumbered.

A. Claims 1, 6 and 8-11 are rejected under 35 U.S.C. §102(b) as being anticipated by Chang, U.S. Patent No. 5,605,873. The Examiner states:

Regarding claims 1, 6 and 8, Chang discloses a pressure sensitive verification system and use thereof comprising a material 14 having a surface, an indicator coating having an impact-sensitive component that produces a visible change when subjected to a mechanical impact, the indicator coating comprising a mixture of a first reactant and a second reactant separated by a barrier that is rupturable so that the reactants mix and produce the visible change upon the impact and inspecting the material for the presence of the visible change (See Col. 5, lines 35 – 44 and Col. 7, lines 12 – 21).

Regarding claims 9 and 10, a light absorbing compound is incorporated into the rupturable barrier and a chromogenic compound enabling the chromogenic compound to react with the color developer (See Col. 7, lines 22 – 26 and 40 – 46).

Regarding claim 11, in Chang, the material is accurately monitored during a series of tests (See Col. 10, lines 22 – 37).

Regarding claims 12, 13, 18 and 19, a design criteria is established for the material for various configurations (Col. 10, lines 22 – 37).

Applicant notes that Anticipation- Application of 35 U.S.C. 102(a), (b) and (e) is set forth in MPEP 2131. The MPEP clearly states:

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). >"When a claim covers several structures or compositions, either generically or as alternatives, the claim is deemed anticipated if any of the structures or compositions within the scope of the claim is known in the prior art." *Brown v. 3M*, 265 F.3d 1349, 1351, 60 USPQ2d 1375, 1376 (Fed. Cir. 2001) (claim to a system for setting a computer clock to an offset time to address the Year 2000 (Y2K) problem, applicable to records with year date data in "at least one of two-digit, three-digit, or four-digit" representations, was held anticipated by a system that offsets year dates in only two-digit formats). See also MPEP § 2131.02. "The identical invention must be shown in as complete detail as is contained in the ... claim." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). The elements must be arranged as required by the claim, but this is not an *ipsissimis verbis* test, i.e., identity of terminology is not required. *In re Bond*, 910 F.2d 831, 15 USPQ2d 1566 (Fed. Cir. 1990). Note that, in some circumstances, it is permissible to use multiple references in a 35 U.S.C. §102 rejection. See MPEP 2131.01.

In addition, MPEP 2111.01 – Plain Meaning indicates that words must be given their plain meaning.

Independent claim 1 clearly states that the method is directed to a method of indicating mechanical impact on a material. The claim clearly recites that the indicator paint has an impact-sensitive component that produces a visible change when subjected to mechanical impact and the material having the indicator paint thereon is placed into circumstances where it may be subject to mechanical impact.

The Examiner relies on Chang and notes that Chang discloses a pressure sensitive verification system. The Examiner categorizes the pressure sensitive verification system of Chang as an impact-sensitive component. However, a careful reading of Chang indicates that impact-sensitive is not disclosed or taught. Only pressure-sensitive is taught, and is disclosed in Chang in Col.5, lines 33-44, relied on by the Examiner. This is not what Applicant claims. If the Examiner is to maintain the rejection of claim 1 under 35 U.S.C. §102, applicant requests the Examiner to

specifically identify where in Chang "impact" or "impact-sensitive" is disclosed. Applicant claims a system that utilizes a paint having an impact-sensitive component. Application of the plain meaning standard, as understood by one skilled in the art, is by reference to McGraw-Hill Dictionary of Scientific and Technical Terms, which definitions are appended to this response, revealing a striking difference (no pun intended) between pressure (a type of stress exerted uniformly) and impact (collision between two bodies). The difference between impact and pressure is important in the context of the present invention. Composite materials are used in modern aircraft as a weight reduction mechanism. However, these composite materials are subject to damage when subject to impact, and the effect of an impact during flight may not be readily obvious without an aid, such as provided by the claimed invention. Failure to detect an impact in such composite materials could lead to a failure of the part made from a composite, which in turn could lead to a catastrophic failure of the aircraft.

Claim 1 claims a paint having an impact-sensitive component, while the reference relied upon by the Examiner discloses a pressure sensitive verification system. Impact is not disclosed in Chang. Since every limitation of claim 1 requiring impact is not found in Chang, which is directed to pressure-sensitive systems, Chang does not anticipate Claim 1, and the rejection of claim 1 as anticipated by Chang should be withdrawn.

Claims 6 and 8-11 are dependent on claim 1 and add further limitations to those set forth in claim 1. Since these claims incorporate all of the limitations of claim 1 and claim 1 is not anticipated, claims 6, 8 and 11 also cannot be anticipated. The rejection of claims 6 and 8-11 as anticipated by Chang should also be withdrawn.

Claims 12 and 13 are also dependent on claim 1 and add further limitations on those limitations set forth in claim 1. Since these claims incorporate all of the limitations of claim 1 and claim 1 is not anticipated, claims 12 and 13 also cannot be anticipated. The rejection of claims 12 and 13 as anticipated by Chang should also be withdrawn.

Claims 18 and 19 are dependent on claim 14 and add further limitations on those limitations set forth in claim 14. Since these claims incorporate all of the limitations of

claim 14 and claim 14, which is discussed below, is not obvious over the cited combination of references, claims 18 and 19 should also be patentable. The rejection of claims 18 and 19 should be withdrawn.

B. Claims 2-5, 14-19, 24 and 25 are rejected under 35 U.S.C. §103(a) as being unpatentable over Chang ('873) in view of Szweda et al. (5,488,017). The Examiner states:

Regarding claims 2 - 5, 14, 24 and 25, Chang discloses all of the limitations of these claims except for a teaching that the material has a tensile elongation to failure of less than about 2 percent. However, Szweda et al disclose a fiber reinforced ceramic matrix composite member comprising a reinforced ceramic matrix composite member represented by curve 2 having a percent elongation of failure in excess of about 0.4% (See Col. 8, lines 21 - 23).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Chang according to the teachings of Szweda et al for the purpose of, producing ceramic composite articles including a method of controlling the porosity in the matrix of a ceramic matrix composite material to curb undesirable porosity (See Szweda et al, Col. 3, lines 24 - 26).

Regarding claims 15 and 16, in Chang, a light absorbing compound is incorporated into the rupturable barrier and a chromogenic compound enabling the chromogenic compound to react with the color developer (See Col. 7, lines 22 - 26 and 40 - 46).

Regarding claim 17, in Chang, the material is accurately monitored during a series of tests (See Col. 10, lines 22 - 37).

Regarding claims 18 and 19, in Chang, a design criteria is established for the material for various configurations (Col. 10, lines 22 - 37).

Applicant traverses this rejection. MPEP §2143.03 states:

2143.03 All Claim Limitations Must Be **>Considered< [R-6] - 2100
Patentability

2143.03 All Claim Limitations Must Be **>Considered< [R-6]

** "All words in a claim must be considered in judging the patentability of that claim against the prior art." *In re Wilson*, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970). If an independent claim is nonobvious under 35 U.S.C. §103, then any claim depending therefrom is nonobvious. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988).

Claims 2-5 are dependent from claim 1 incorporate all of the limitations of claim 1, which as noted above, is not anticipated by the prior art. Since independent claim 1 is not anticipated and patentable, dependent claims 2-5, which incorporate all of the limitations of claim 1 as well as additional limitations should also be patentable.

Claim 14 is an independent claim and has been amended to clearly specify that the composite material is for an aircraft, and claims 15-19 and 24-25 are dependent on claim 14, incorporating all of the limitations of claim 14 and adding additional limitations. This claim has been made to incorporate the specific embodiment of an aircraft composite material, as the present invention, as discussed above, is of critical importance when using composite materials in an aircraft application in order to detect impact, as failure to detect impact may lead to a catastrophic failure of the composite material comprising the aircraft component.

With regard to claim 14 and MPEP §2143.03, all claim limitations must be considered. Claim 14 is directed to a method of indicating the presence of mechanical impact on a composite material. The claim, in part is directed to

preparing an indicator paint having an impact-sensitive component
that changes color when subjected to a mechanical impact, wherein the
indicator paint comprises a mixture of
a first reactant, and
a second reactant,

wherein the first reactant and the second reactant are separated by a barrier that is ruptured when the indicator paint is subjected to the mechanical impact;

applying the indicator paint to the surface of the composite material;
placing the composite material having the indicator paint thereon into circumstances where it may be subject to the mechanical impact; and thereafter

inspecting the composite material having the indicator paint....

As noted above, "impact" and "impact-sensitive" and "pressure" and "pressure sensitive" have two different meanings, and one skilled in the art would not equate "impact" and "impact-sensitive" and "pressure" and "pressure sensitive." The directive of MPEP 2143.03 with regard to the claim limitations would lead one skilled in the art to recognize the non-obviousness of claim 14 over the cited prior art.

If the differences between the meanings of impact and pressure are insufficient to convince the Examiner of the patentability of the claims, then Applicant notes the requirements of MPEP §2141.02 Differences Between Prior Art and Claimed Invention [R-5] - 2100 Patentability, subsection VI which states:

VI. PRIOR ART MUST BE CONSIDERED IN ITS ENTIRETY, INCLUDING DISCLOSURES THAT TEACH AWAY FROM THE CLAIMS

A prior art reference must be considered in its entirety, i.e., as a whole, including portions that would lead away from the claimed invention. *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983), *cert. denied*, 469 U.S. 851 (1984) (Claims were directed to a process of producing a porous article by expanding shaped, unsintered, highly crystalline poly(tetrafluoroethylene) (PTFE) by stretching said PTFE at a 10% per second rate to more than five times the original length. The prior art teachings with regard to unsintered PTFE indicated the material does not respond to conventional plastics processing, and the material should be stretched slowly. A reference teaching rapid stretching of conventional plastic polypropylene with reduced crystallinity combined with a reference teaching stretching unsintered PTFE would not suggest rapid stretching of highly crystalline PTFE, in light of the disclosures in the art that teach away from the invention, i.e., that the conventional polypropylene should have reduced crystallinity before stretching, and that PTFE should be stretched slowly.).

However, "the prior art's mere disclosure of more than one alternative does not constitute a teaching away from any of these alternatives because such disclosure does not criticize, discredit, or otherwise discourage the solution claimed..." *In re Fulton*, 391 F.3d 1195, 1201, 73 USPQ2d 1141, 1146 (Fed. Cir. 2004). >See also MPEP 2123.

The cited prior art reference teaches away from applicant's invention. As noted above, which argument is incorporated herein, the Chang reference teaches a pressure-sensitive system, whereas the applicant's system is directed to an impact-sensitive system, that is activated on striking or as a result of a collision. Applicant, in its Description, paragraph [0022], and in the following paragraphs discuss in detail the use of the impact-sensitive system on an aircraft, which clearly illustrates the differences between impact and pressure. If the system of Chang were to be substituted for the invention claimed by the applicant, the high speed of an aircraft would result in activation of the pressure-sensitive system of Chang. It is well known in the art that as an object (aircraft) moves through a fluid (air), the velocity of the fluid changes around the object surface, resulting in a variation of pressure on the surface of the object. This simply stated fact is set forth by complex equations (one detailed analytical evaluation can be found at cosmos.ucdavis.edu "HIGH SPEED AERODYNAMICS," Joseph Chung, Cluster 3 COSMOS, August 3, 2006), but is experienced by any child who has stuck its head outside the window of a moving automobile. The relative velocity of the fluid (air) over the face is felt by the child. The same child whose head is outside of the window of the moving automobile that is struck (i.e. collision) by an airborne object, such as an insect, (i.e. collision) will experience impact, and will immediately experience and know the difference between pressure changes and impact.

The Chang invention, being sensitive to increased pressure, would react to the pressure change as a result of high speed flight and would be activated. This would make the invention of Chang useless in such an application, as pressure variations of flight cause it to activate. The present invention however, must be impervious to the continuous pressure changes as the aircraft moves through the fluid at a high speed, and would be useless if, as the change invention, it is activated by pressure. Rather, the present invention, as claimed, must only be activated as a result of mechanical

impact (collision or striking) as claimed, and not as a result of increased pressure which will result from flight. Therefore, Chang teaches away from the invention as claimed.

Applicant further notes that the combination of Chang and Sweda does not yield the applicant's invention as claimed. Applicant notes that one of the limitations of claim 14 is applying the indicator paint to the surface of a composite material, and notes that the composite material, in the claim as amended, is for an aircraft. Applicant notes that Chang includes no teaching or suggestion of painting. It specifically discloses application of a chromogenic coating by printing. Its purpose is to impose this coating on a document for verification in a very specific and discrete location on the document. However, painting, as that term is understood, would defeat the purpose of the invention by obscuring important information on the document and also by not being discrete. It also is clear from an evaluation of the Chang reference as a whole, that in addition to being discrete, the coating should be capable of being applied quickly. Painting is not one of the methods that is contemplated for application of the chromogenic coating of Chang while meeting its objectives. While the Sweda reference, discloses a composite material, it does not disclose painting. Certainly, painting a composite material is a solution to a different problem than one skilled in the art would expect to solve in applying a discrete chromogenic coating to a paper or document. Applicant respectfully submits that the combination of Chang and Sweda do not teach or suggest one of the claim limitations, namely, the step painting the composite surface of an aircraft. Since one of the claim limitations is missing, the combination does not render claim 14 obvious.

Applicant submits that the combination of Chang and Sweda does not yield applicant's invention. First, one of the essential claim limitations is missing. In addition, even if the combination could be made, that is, even if the coating of Chang could be printed onto a composite material, it would still not work as intended in the Examiner's proposed combination to yield applicant's claimed invention, since it is sensitive to pressure, whereas applicant's invention must be insensitive to pressure, which the composite may experience simply as a result of high speed flight, yet sensitive to impact, as claimed. While the Examiner's proposed combination may be effective for

certain applications, it is not what applicant claims, nor will it work as in the manner of applicant's invention. Applicant requests withdrawal of the rejection of claim 14.

The remaining claims, claims 15-19 and 24-25, being dependent on a non-obvious claim also should be non-obvious and allowable.

CONCLUSION

Applicant requests withdrawal of the rejection of claims 1, 6, 8-11 as anticipated by Chang, since Chang does not disclose a system activated by impact, but rather by pressure. Applicant requests withdrawal of the rejection of claim 2-5, 14, and 24-25 under 35 U.S.C. §103(a) based on the combination of Chang and Sweda, since the suggested combination yields a pressure-activate system and does not yield applicant's invention, which is a system to a method of indicating the presence of mechanical **impact** on a composite material that is painted on the composite material of an aircraft. Applicant requests allowance of all claims.

The Commissioner is hereby authorized to charge indicated fees and credit any overpayments to Deposit Account No. 50-1059.

Respectfully submitted,

/Carmen Santa Maria/

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On the cover: Representation of a fullerene molecule with a noble gas atom trapped inside. At the Permian-Triassic sedimentary boundary the noble gases helium and argon have been found trapped inside fullerenes. They exhibit isotope ratios quite similar to those found in meteorites, suggesting that a fireball meteorite or asteroid exploded when it hit the Earth, causing major changes in the environment. (Image copyright © Dr. Luann Becker. Reproduced with permission.)

Over the six editions of the Dictionary, material has been drawn from the following references: G. M. Garby et al., *Taxonomic Outline of the Procaridae*, Release 2, Springer-Verlag, January 2002; D. W. Lister, *Vertebrate Biology*, McGraw-Hill, 2001; J. A. Pachewski, *Biology of the Invertebrates*, 4th ed., McGraw-Hill, 2000; U.S. Air Force Glossary of Standardized Terms, AF Manual 11-1, vol. 1, 1972; F. Casey, ed., *Compilation of Terms in Petroleum, Sciences, Technology, Federal Council for Science and Technology*, 1970; *Communications-Electronics Terminology*, AF Manual 11-1, vol. 3, 1970; P. W. Tetlow, comp. and ed., *A Dictionary of Mining, Mineral, and Related Terms*, Bureau of Mines, 1966; *A DOD Glossary of Mapping, Charting and Geomatics Terms*, Department of Defense, 1967; J. M. Gilliland, *Solar Terrestrial Physics: A Glossary of Terms and Abbreviations*, Royal Aircraft Establishment Technical Report 67158, 1967; W. H. Allen, ed., *Dictionary of Technical Terms for Aerospace Use*, National Aeronautics and Space Administration, 1965; *Glossary of Staff Terminology*, Office of Aerospace Research, U.S. Air Force, 1963; *Naval Dictionary of Electronic, Technical, and Imperative Terms*, Bureau of Naval Personnel, 1962; K. E. Huchko, *Glossary of Meteorology*, American Meteorological Society, 1959; *ADP Glossary*, Department of the Navy, NAVSO P. 3067; *Glossary of Air Traffic Control Terms*, Federal Aviation Agency; *A Glossary of Range Terminology*, White Sands Missile Range, New Mexico; National Bureau of Standards, AD 467-424, *Nuclear Terms: A Glossary*, 3d ed., Avenue, Energy Commission.

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impact [MECH] A forceful collision between two bodies which is sufficient to cause an appreciable change in the momentum of the system on which it acts. Also known as impulsive force. { 'im,pakt }

pressure [MECH] A type of stress which is exerted uniformly in all directions; its measure is the force exerted per unit area. { 'presh·ər }